AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): An electro-optical system capable of being embarked aboard ~~ground-moving-or-flying-units~~a mobile unit, for determining ~~the~~ optical flow generated by obstacles in relative motion with respect to the mobile unit characterized in that it comprises radiation emitter means (5), receiver means (1) for converting the radiation reflected by objects into electrical signals and means (8) for processing the signals generated by said receiver means (1), in which said receiver means (1) comprise at least a vision sensor with receiver matrix configuration and in which said emitter means (5, 6) conform the radiation beam in such a way that the radiation reflected by objects and collected by the receiver means impacts at least a part of the receiver matrix configuration , and in which said processing means compute the optical flow only on the elements of the receiver matrix configuration that are impacted by the radiation.

2. (previously presented): A system as claimed in claim 1, characterized in that the optical flow is determined within a predetermined distance range.

3. (currently amended): A system as claimed in claim 2, characterized in that ~~the~~ a maximum distance of the objects that contribute to the optical flow is determined by the intensity

of the radiation emitted by the emitter means (5), by the reflectance of the objects impacted by the radiation and by the sensitivity of the receiver means (1).

4. (previously presented): A system as claimed in claim 1, characterized in that the distribution and the shape of the receivers within the matrix are linked to the shape of the beam of radiation emitted by the emitter means (5).

5. (previously presented): A system as claimed in claim 1, characterized in that it comprises a band-pass optical filter with narrow band (2), with the transmittance peak centered at the emission peak of the emitter means (5).

6. (currently amended): A system as claimed in claim 1, characterized in that said ~~sensor~~ receiver means (1) comprise a matrix of CCD or CMOS sensors.

7. (currently amended): A system as claimed in claim 1, characterized in that the radiation beam (7) generated by the emitter means (5) is shaped in such a way that the radiation (4) reflected by the objects and focused on the ~~sensor matrix~~ receiver means (1) impacts a single array of sensors or a sheaf of adjacent sensor arrays.

8. (currently amended): A system as claimed in claim 1, characterized in that the radiation beam (7) generated by the emitter means (5 6)) is shaped in such a way that the

radiation (4) reflected by the objects and focused on the ~~sensor matrix~~ receiver means (1) impacts a set of mutually separate rows.

9. (currently amended): A system as claimed in claim 1, characterized in that the radiation beam (7) generated by said emitter means (5, 6)) is shaped in such a way that the radiation (4) reflected by the objects and focused on the ~~sensor matrix~~ receiver means (1) impacts a set of sheaves of rows, where the rows of each sheaf are mutually adjacent and the sheaves are separate from each other.

10. (currently amended): A system as claimed in claim 1, characterized in that the radiation beam (7) generated by said emitter means (5, 6) is shaped in such a way that the radiation (4) reflected by the objects and focused on the ~~sensor matrix~~ receiver means (1) impacts a single column or a sheaf of adjacent columns.

11. (currently amended): A system as claimed in claim 1, characterized in that the radiation beam (7) generated by said emitter means (5, 6) is shaped in such a way that the radiation (4) reflected by the objects and focused on the ~~sensor matrix~~ receiver means (1) impacts a plurality of mutually separate columns.

12. (currently amended): A system as claimed in claim 1, characterized in that the radiation beam (7) generated by said emitter means (5 , 6)) is shaped in such a way that the

radiation (4) reflected by the objects and focused on the ~~sensor matrix~~ receiver means (1) impacts a set of sheaves of columns, where the columns of each sheaf are mutually adjacent and the sheaves are separate from each other.

13. (currently amended): A system as claimed in claim 1, characterized in that the radiation beam (7) generated by said emitter means (5, 6) is shaped in such a way that the radiation (4) reflected by the objects and focused on the ~~sensor matrix~~ receiver means (1) impacts a single line or a set of mutually parallel lines, parallel to the main direction of motion (10).

14. (currently amended): A system as claimed in claim 1, characterized in that the radiation beam (7) generated by said emitter means (5, 6)) is shaped in such a way that the radiation (4) reflected by the objects and focused on the ~~sensor matrix~~ receiver means (1) impacts a set of canted lines each parallel to one of the main directions of motion.

15. (currently amended): A system as claimed in claim 1, characterized in that the radiation beam (7) generated by said emitter means (5 6) is shaped in such a way that the radiation (4) reflected by the objects and focused on the ~~sensor matrix~~ receiver means (1) impacts a set of sheaves of lines, where the lines of each sheaf are parallel to each other and parallel to one of the components of the motion, whilst the beams are not parallel to each other.

16. (previously presented): A system as claimed in claim 15, characterized in that the different sheaves of lines are generated by as many distinct radiation sources.

17. (previously presented): A system as claimed in claim 16, characterized in that the radiation sources for the different sheaves have a different peak wavelength.

18. (previously presented): A system as claimed in claim 17, characterized in that the different sheaves of lines with the different wavelengths collected distinct are receivers.

19. (currently amended): An autonomous navigation device comprising a plurality of systems ~~according to claim 1~~ capable of being embarked aboard a mobile unit, for determining optical flow generated by obstacles in relative motion with respect to the mobile unit characterized in that it comprises radiation emitter means (5), receiver means (1) for converting the radiation reflected by objects into electrical signals and means (8) for processing the signals generated by said receiver means (1), in which said receiver means (1) comprise at least a vision sensor with receiver matrix configuration and in which said emitter means (5, 6) conform the radiation beam in such a way that the radiation reflected by objects and collected by the receiver means impacts at least a part of the receiver matrix configuration , and in which said processing means compute the optical flow only on the elements of the receiver matrix configuration that are impacted by the radiation, each system oriented in a different spatial direction, angularly

separated from the others, so that the fields of view of the individual electro- optical systems do not overlap.

20. (currently amended) device for detecting obstacles comprising plurality systems ~~according to claim 1,~~ capable of being embarked aboard a mobile unit, for determining optical flow generated by obstacles in relative motion with respect to the mobile unit characterized in that it comprises radiation emitter means (5), receiver means (1) for converting the radiation reflected by objects into electrical signals and means (8) for processing the signals generated by said receiver means (1), in which said receiver means (1) comprise at least a vision sensor with receiver matrix configuration and in which said emitter means (5, 6) conform the radiation beam in such a way that the radiation reflected by objects and collected by the receiver means impacts at least a part of the receiver matrix configuration , and in which said processing means compute the optical flow only on the elements of the receiver matrix configuration that are impacted by the radiation, each system oriented different spatial direction, angularly separated from the others so that the fields of view of the individual electrooptical systems mutually overlap at least partially.

21. (Currently Amended) An anti-collision system or an autonomous navigation system for mobile units, characterized in that it comprises and electro-optical system ~~for measuring the optical flow according to claim 1~~ capable of being embarked aboard a mobile unit, for determining optical flow generated by obstacles in relative motion with respect to the mobile

unit characterized in that it comprises radiation emitter means (5), receiver means (1) for converting the radiation reflected by objects into electrical signals and means (8) for processing the signals generated by said receiver means (1), in which said receiver means (1) comprise at least a vision sensor with receiver matrix configuration and in which said emitter means (5, 6) conform the radiation beam in such a way that the radiation reflected by objects and collected by the receiver means impacts at least a part of the receiver matrix configuration , and in which said processing means compute the optical flow only on the elements of the receiver matrix configuration that are impacted by the radiation.

22. (previously presented): A system as claimed in claim 21, characterized in that it comprises a " strap- down" inertial navigation device.

23. (previously presented): A system as claimed in claim 22, characterized in that the inertial navigation device comprises three gyroscopes, three accelerometers and/or a magnetometer with three axes used as course indicator and/or a satellite positioning system.

24. (currently amended): An electro-optical according to claim 1, wherein ~~the~~ algorithms for determining the optical flow are implemented on a processor using VLSI (Very Large Scale Integration) technology.

25. (previously presented): An electro-optical system as claimed in claim 1, characterized in that it comprises an optical device for measuring the distances of obstacles.

Kindly add the following new claim:

26. (new): An electro-optical system capable of being embarked aboard a mobile unit, for determining optical flow generated by obstacles in relative motion with respect to the mobile unit characterized in that it comprises radiation emitter means (5), receiver means (1) for converting the radiation reflected by objects into electrical signals and means (8) for processing the signals generated by said receiver means (1), in which said receiver means (1) comprise at least a vision sensor with receiver matrix configuration and in which said emitter means (5, 6) conform the radiation beam in such a way that the radiation reflected by objects and collected by the receiver means impacts only a part of the receiver matrix configuration, and in which said processing means compute the optical flow only on the elements of the receiver matrix configuration that are impacted by the radiation.